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pollen-collecting bees ; so that, at the start, all male bees and all cuckoo-bees are excluded. Then the visitors must be intelligent enough to know how to snap the flowers and to keep from being frightened by their explosion. For this reason the visitors of *Desmodium* are the most intelligent of the genera to which they belong, or are at least more used to visiting flowers of complicated structure.

On the six species of *Desmodium* mentioned above there occur two species of *Bombus*, one of *Melissodes*, two of *Megachile* and one of *Calliopsis*. Of eight species of *Bombus* which occur in my neighborhood, *B. americanorum* is the most intelligent and the most important visitor of irregular flowers. This bee was seen on the flowers of four species, while *B. separatus* was seen only on *D. Canadense*. Of seven species of *Melissodes*, *M. bimaculata* is most common on irregular flowers, while the others occur more often on *Compositæ*. Most of twelve species of *Megachile* also limit their attentions to *Compositæ*, while *M. brevis* and *M. mendica* are common on irregular flowers. The same is true of the five species of *Calliopsis*, *C. audreniformis* being the only one observed on irregular flowers.

The larger flowered species also limit their visitors by the strength required to discharge them. Thus, *D. Canadense* is most abundantly visited by humble bees, since the smaller bees, like *Megachile*, can only snap them with difficulty. The little *Calliopsis audreniformis* is neither strong enough to spring the trap nor is it large enough to receive the pollen. But while the small bees are excluded from the large flowers, the large bees can easily discharge and receive the pollen of the smaller flowers. As a consequence, the smaller flowers, like *D. paniculatum*, are sought by a greater number of species. But the very small flowers of *D. Marilandicum* seem to depend exclusively upon *Calliopsis*.

Carlinville, Ill.

Mycologic observations. I.

A. P. MORGAN.

(*January, 1890.*)

1. The winter season can not usually be considered very favorable to the growth of fungi ; nevertheless during warm and mild rainy spells many kinds will be found growing. Aside from the woody and leathery forms which are peren-

nial or remain alive till spring, I have noted this month some 25 or 30 different species.

2. Little or nothing is to be found coming up out of the ground, but on old trunks there are occasionally tufts of *Agaricus sapidus*, and about the roots or upon the erect, dead trunk of willows or sometimes of sugar maple may be seen the yellow tufts of *Agaricus velutipes*. An old dead tree in the deep woods is always a fertile subject. Look along it and underneath it. Pull off its bark, examine the inside and the wood next it. You will find *Myxos*, *Hyphos*, *Pezizas*, etc.

3. During the winter season flourish best many kinds of Tremellas and their kindred. *Hirneola* or Jew's Ear grows here and there on the hard wood of hickory and maple, *Exidias* are strung along the trunk and branches of all sorts of trees, and the yellow *Guepinias* spring out of the clefts of the wood. Here is a fertile field for the study of forms. In our aversion to "species making," it is a constant effort to refer our American species to European forms already described. So far as Hymenomycetes are concerned more mistakes have been made in this direction than in any other.

4. SCHIZOPHYLLUM. I have lately been catching the spores of the common *Schizophyllum* on a slide and trying to find them "almost globular;" but they are invariably oblong, somewhat apiculate, and on the average $5-6 \times 2.5$ mic. Is ours a different species or is there a mistake somewhere? Do any of our friends find specimens with the spores "subrotund?"

5. MENISPORA. The species of this genus are pretty *Hyphos*. The most common is *Menispora Libertiana*; in fact it is very common. Its spores are much larger and more obtuse than those of *M. ciliatā*, which I frequently meet with also. Other species, whose spores are without the cilia, I occasionally find, such as the *M. glauca* and *M. apicalis* or something similar. *M. cobaltina* is very curious and rare; I have found it but once, and then it was running over old dead leaves.

6. ARTHROSPORIUM. Late in autumn and continuing through the winter until spring, the colonies of *A. compositum* Ellis are to be found on the underside of old, much decayed oak chunks; it nestles in the holes and crevices in total darkness, spreading over the surface and looking to the naked eye like a minute resupinate *Hydnum*. It is a pretty microscopic object, and I am always pleased to bring in a

fresh specimen and take another look at it. The spores are triseptate *fusiform*, not "filiform," as the Sylloge has it.

7. *BACTRIDIDIUM*. There seems to me to be but a single species; with moist weather it grows throughout the year; it is a very interesting object under low power; the spores are extremely large and in a drop of water tumble down like ninepins. They are most commonly 4-septate, as I observe them, with the middle cell much the largest; this corresponds to *B. clavatum* B. & Br.; 1-3-septate specimens are not uncommon, which will pass for *B. Ellisii* Berk.; rarely I bring in a specimen with abundant spores 5, 6 and even 7-septate; there seems nothing to hinder this being *B. flavum* K. & S.

8. *Nematelia nucleata* Schw. The plant I have so referred has white, oblong curved spores 10-12 mic. in length. The European (?) plant under this name, with ovoid spores 7 mic. long, must be something different. It is very common with me on branches of sugar maple; it originates beneath the bark and shows itself in lines along the crevices.

9. *Stereum albobadium* Schw. I have lately observed that the velvety surface of the hymenium in this species is caused by hyaline fusiform bodies with a warted surface, called *metuloids*; hence it belongs in Dr. Cooke's genus *Peniophora*.

10. *Dacrymyces deliquescens* Bull. Bringing in some specimens, the other day, I caught the spores on a slide in great abundance, and observed that against white paper they were a pale yellow in color. They are invariably 3-septate, and my measurements of the mature spores were $14-16 \times 6-7$ mic., smaller than Karsten's, but about the same as Saccardo's.

Preston, Ohio.

A Revision of North American Cornaceæ. II.

JOHN M. COULTER AND WALTER H. EVANS.

++++ Lower leaf-surface with only straight appressed-pubescence (except sometimes no. 14) or none.

14. *C. stolonifera* Michx. Fl. 1.92. Shrub is 1 to 3 meters high, erect or prostrate, stoloniferous, with branches usually bright red-purple and smooth: branchlets and inflorescence appressed-pubescent: petioles 6 to 36 mm. long; leaves from lanceolate to broadly ovate or oblong, short or long acuminate